

IN THE CLAIMS

1. (Currently Amended) A method for processing events in a managed information system comprising:

receiving an event subscription containing an event identity for an event, the event corresponding to ~~significant~~reportable occurrences in the managed information system;

associating the event identity with an event handler responsive to the event by creating a mapping of the event identity to the event handler;

receiving a publication of the event; and

traversing, in response to the publication, the mapping of the event identity to an indication of the corresponding associated handler, the traversing operable to enable the module including the event handler if the module is disabled at the time of publishing the event, enabling modules corresponding to activation of a corresponding component by an activation mechanism, and disabling corresponding to deactivation of the corresponding component by the activation mechanism, the activation and deactivation operations operable to reduce memory consumption by inactive components and provide selective invocation to maintain availability of the component, the enabling and disabling performed at a level of granularity of the modules, each of the modules corresponding to a component and operable be enabled and disabled by activation and deactivation of the corresponding component.

2. (Original) The method of claim 1 further comprising:

identifying, using the associated event identity, the particular handler corresponding to the subscribed event in the enabled module including the handler;

invoking, using the state of the enabled module, the event handler.

3. (Original) The method of claim 1 wherein traversing further comprises:

receiving the event publication according to a genericizing reference; and
identifying an event specific class corresponding to the event, the
event specific class transparent to the mapping via the genericizing reference
and operative to distinguish the received events from other events.

4. (Original) The method of claim 1 wherein traversing further
comprises:

determining if a particular module including the corresponding
event handler is enabled; and

selectively enabling, if the module including the corresponding
event handler is disabled, the module for enabling the event handler for receipt
and subsequent processing of the published event.

5. (Original) The method of claim 4 further comprising, following
selective enabling of the module containing the corresponding handler:

determining the mapping of the enabled module and corresponding
event handler; and

invoking the module including the corresponding event handler via
the mapping.

6. (Original) The method of claim 1 wherein traversing further
comprises

identifying the event in a persistent event mapping, the persistent
event mapping indicative of modules containing event handlers associated with
the event; and

dispatching, in the identified modules, the associated event
handlers.

7. (Original) The method of claim 6 wherein dispatching further
comprises:

-4-

selectively receiving an enablement indication in response to traversing in the persistent event mapping;
identifying, in a local event mapping for the enabled module, subscriber entities including handlers associated with the mapped event; and
invoking, in the mapped module, the identified subscribers including associated handlers.

8. (Original) The method of claim 6 wherein the persistent mapping of the event is operable to maintain the event independently of individual modules referencing the event, the independent maintenance operable to avoid copy constructors of the event for enabling successive references to the same event.

9. (Original) The method of claim 2 further comprising:
disabling a publishing component performing the publishing prior to invoking the module including the event handler; and
completing the invocation of the corresponding handler while the publishing component remains disabled.

10. (Original) The method of claim 1 further comprising defining a plurality of events, the plurality of events associated with a genericizing reference, the genericizing reference inclusive of the plurality of events and each of the events associated with an event specific class having event data indicative of event specific parameters.

11. (Original) The method of claim 10 wherein the event data includes event variables generated and passed by the publisher of the event and subscriber instantiated variables generated by the state information of the subscriber.

12. (Original) The method of claim 10 further comprising enumerating a plurality of events, wherein the event further comprises the plurality of events associated with the common genericizing reference inclusive of the plurality of events, and wherein receiving the event subscription avoids event specific code generation of code and code fragments associated with the specific event.

13. (Original) The method of claim 10 wherein the common genericizing reference and associated event specific class avoids event specific stubs and references related to the event specific class.

14. (Original) The method of claim 1 wherein a subscribing software entity issuing the received event subscription becomes disabled following the subscription until an occurrence and subsequent publication of the event.

15. (Original) The method of claim 1 wherein publication of the event is operable to enable a plurality of subscribing software entities, each subscribing entity including a particular responsive event handler for handling that event.

16. (Original) The method of claim 6 wherein traversing further comprises indexing, in the persistent mapping via the event identity, a persistent reference to the modules including the event handlers associated with the event, the persistent reference operable to identify a handler independently of enablement of the module containing the associated event handler.

17. (Original) The method of claim 1 wherein associating the event identity by creating a mapping with the event handler further comprises:

creating, via a component event service, a local mapping entry in the component event map having a reference to the subscriber entity including the corresponding event handler, and

creating a persistent mapping entry corresponding to the component including the corresponding event handler, the persistent mapping entry operable to trigger selective enablement of the handling component by a plurality of subscribing entities, wherein mapping further comprises:

identifying at least one of the persistent mapping entries corresponding to the published event, each of the mapping entries indicative of a module; and

identifying, via the local event map in the indicated modules, a plurality of subscribers including the corresponding event handlers in the identified modules associated with the event.

Claims 18-19. (Canceled)

20. (Currently Amended) The method of claim ~~18~~1 wherein activation and deactivation further comprises identifying, in a component server in communication with the shared memory portion, when to activate and deactivate components based on information in the persistent event map in the shared memory portion, and further for determining when to store the information in the component server rather than shared memory if no other component servers reference the information.

21. (Currently Amended) The method of claim ~~18~~1 wherein each of the modules is operable to include a plurality of threads, and disabling is performed by a thread manager operable to gracefully terminate each of the threads prior to deactivation, deactivation occurring by informing each of the threads of the termination and computing when each thread has attained a termination point.

22. (Original) The method of claim 1 wherein associating the event identity with an event handler occurs in a native language of the event handler and corresponding subscriber, and avoids a corresponding definition in an

-7-

external interface language, the external interface language for generating event specific code.

23. (Currently Amended) The method of claim 22 wherein the external interface language is ~~an the Object Management Group~~ Interface Definition Language (OMG/IDL).

24. (Original) The method of claim 23 wherein associating the event identity with an event handler further comprises generating a local mapping via a component event service identifying a subscribing entity including an event handler corresponding to the event identity, and
generating a persistent event mapping identifying the module including the event handler corresponding to the event identity.

25. (Original) The method of claim 24 further comprising selectively generating the persistent event mapping via a strategized allocator if the associating of the event identity occurs in a single module.

26. (Original) The method of claim 1 further comprising a smart event pointer class, wherein publication further comprises:

identifying a plurality of modules having at least one of subscribers and publishers including an event;

referencing, via a reference counting semaphore in the smart event point class, each of the instantiations of the event in a particular module;

identifying, via the reference counting semaphore, when instantiations of the event have completed instructions corresponding to the event handler in each of the particular modules; and

deallocating the event from the persistent event mapping when each module including instantiations of the event has identified completion of instructions corresponding to the event handler.

27. (Original) The method of claim 26 further comprising:
maintaining references to instantiations of the event across multiple modules via the reference counting semaphore, the multiple modules corresponding to a plurality of dynamic allocation mechanisms; and
deallocating, for all of the referenced dynamic allocation mechanisms, the instantiations of the event when each of the multiple modules completes processing of the event.

28. (Original) The method of claim 1 wherein the subscribing entity, publishing entity, and handling entity are user software entities responsive to the local event service for execution, activation, and inactivation.

29. (Currently Amended) A method for low footprint interprocess communication in an information retrieval environment comprising:
defining an event indicative of a ~~significant~~reportable occurrence in the information retrieval environment, the event corresponding to a common class associated with a plurality of events;
subscribing, from a local subscriber in a local process, to the event for establishing reporting of the event, subscribing further including specifying an event handler operable to process the event, the local subscriber issuing the received event subscription becoming disabled following the subscription until an occurrence and subsequent publication of the event;
registering an indication of the subscription in a local map providing a local mapping operative for associating events and event handlers in the local process for invoking the event handler responsively to an occurrence of the defined event;
registering an indication of the subscription in a global map providing a persistent mapping operative for associating events with event handlers, and further operable to invoke components including event handlers in remote processes;

-9-

receiving a publication of the event from a monitoring component;
dispatching an indication of the publication to local subscribers;
propagating an indication of the publication to the global event service;
and
invoking the component including the specified event handlers in response to the dispatching and propagating the indication of event publication, invoking including indexing, in the persistent mapping via the event identity, a persistent reference to the modules including the event handlers associated with the event, the persistent reference operable to identify a handler independently of enablement of the module containing the associated event handler, enabling modules corresponding to activation of a corresponding component by an activation mechanism; and
disabling corresponding to deactivation of the corresponding component by the activation mechanism, the activation and deactivation operations operable to reduce memory consumption by inactive components and provide selective invocation to maintain availability of the component.

30. (Original) The method of claim 29 wherein invoking further comprises selective activation of components including associated event handlers, the event handlers in inactive components responding to the dispatch upon activation.

31. (Original) The method of claim 30 wherein the components including the event handlers need not be active during the event publication, the inactive event handlers being invoked accordingly in response to the dispatching, wherein unavailable event handlers consume fewer resources than available event handlers.

32. (Currently Amended) A method for managing modules in an infrastructure environment comprising:

deploying a plurality of events, the events indicative of ~~significant reportable~~ occurrences in the infrastructure environment;

identifying service entities and user entities, the user entities operable for development and modification by a user, and the service entities unavailable for user modifications;

identifying subscribers and publishers in the user entities, the subscribers having an event handler for handling an event, and the publishers operable to generate event data and publish an event to the subscribers of the same event with the corresponding event data, a subscriber issuing the received event subscription becoming disabled following the subscription until an occurrence and subsequent publication of the event;

correlating each of the deployed events with the corresponding subscribers and publishers; and

selectively invoking, upon publication of an event by a publisher, each of the subscribers corresponding to the event, invoking including indexing in a persistent mapping via the event identity, a persistent reference to the modules including the event handlers associated with the event, the persistent reference operable to identify a handler independently of enablement of the module containing the associated event handler,

enabling modules corresponding to activation of a corresponding component by an activation mechanism; and

disabling corresponding to deactivation of the corresponding component by the activation mechanism, the activation and deactivation operations operable to reduce memory consumption by inactive components and provide selective invocation to maintain availability of the component , such that the subscribers and publishers ~~having~~ knowledge only of the event and the event data, the publication avoiding references by the user entities to the service entities processing the correlation of the events with the corresponding subscribers, such that the subscribers and included event handlers are independently active from publishers of the corresponding event.

33. (Currently Amended) A method for interprocess communication comprising:

defining an event indicative of a ~~significant~~reportable occurrence in the information retrieval environment, the event corresponding to a common class associated with a plurality of events;

subscribing, from a local subscriber, to the event for requesting reporting of the event, subscribing further including specifying an event handler operable to process the event, the local subscriber issuing the received event subscription becoming disabled following the subscription until an occurrence and subsequent publication of the event;

registering an indication of the subscription in a local map providing a local mapping operative for associating events and event handlers in a local process for invoking the event handler responsively to an occurrence of the defined event;

registering an indication of the subscription in a global map providing a persistent mapping operative for associating events with event handlers, and further operable to invoke event handlers in remote servers;

receiving a publication of the event from a monitoring component;

dispatching an indication of the publication to local subscribers;

propagating an indication of the publication to the global event service;

and

invoking a module including the specified event handlers in response to the dispatching and propagating the indication of event publication, invoking including indexing, in the persistent mapping via the event identity, a persistent reference to the modules including the event handlers associated with the event, the persistent reference operable to identify a handler independently of enablement of the module containing the associated event handler,

enabling modules corresponding to activation of a corresponding component by an activation mechanism; and

disabling corresponding to deactivation of the corresponding component by the activation mechanism, the activation and deactivation operations operable to reduce memory consumption by inactive components and provide selective invocation to maintain availability of the component.

34. (Currently Amended) An information processing device for processing events in a managed information system comprising:
- a processor operable to perform a set of instructions according to a predetermined sequence;
 - a memory operable to store the instructions and corresponding data items;
 - an interface operable to transmit and receive, based on the instructions, commands and data to other information processing devices in the managed information system;
 - an event service operable to receive an event subscription containing an event identity for an event, the event corresponding to significant reportable occurrences in the managed information system;
 - an event map operable to associate the event identity with an event handler responsive to the event by creating a mapping of the event identity to the event handler; and
 - a subscriber having an event handler operable to receive a publication of the event, the event service further operable to traverse, in response to the publication of the event, the mapping of the event identity to an indication of the corresponding associated event handler, the traversing operable to enable the module including the handler if the module is disabled at the time of publishing the event, traversing further including:
 - identifying the event in a persistent event mapping, the persistent event mapping indicative of modules containing event handlers associated with the event; and

-13-

dispatching, in the identified modules, the associated event handlers, dispatching comprising:

selectively receiving an enablement indication in response to traversing in the persistent event mapping;

identifying, in a local event mapping for the enabled module, subscriber entities including handlers associated with the mapped event; and.....

invoking, in the mapped module, the identified subscribers including associated handlers.

35. (Original) The method of claim 34 wherein the event service further includes:

a component event service operable to identify, using the associated event identity, the particular handler corresponding to the subscribed event in the enabled module including the handler; and

a local event map in the component event service operable for invoking, using the state of the enabled module, the event handler.

36. (Original) The method of claim 34 wherein the event service further includes a global event service, the global event service operable to:

receive the event publication according to a genericizing reference; and

identify an event specific class corresponding to the event, the event specific class transparent to the mapping via the genericizing reference and operative to distinguish the received events from other events.

37. (Original) The method of claim 34 wherein the information processing device further comprises:

an activation manager operable to determine if a particular module including the corresponding event handler is enabled, and further operable to selectively enable, if the module including the corresponding event handler is

disabled, the module for enabling the event handler for receipt and subsequent processing of the published event.

38. (Original) The method of claim 37 wherein the event service is further operable to, following selective enabling of the module containing the corresponding handler:

determine the mapping of the enabled module and corresponding event handler; and

invoke the module including the corresponding event handler via the mapping.

39. (Original) The method of claim 34 wherein the event service further comprises:

a persistent event map operable to identify the published event, the persistent event mapping indicative of modules containing event handlers associated with the event; and

a local event map operable to dispatch, in the identified modules, the associated event handlers.

40. (Original) The method of claim 39 further comprises:

a module containing the event handler, the module operable to selectively receive an enablement indication in response to traversing in the persistent event mapping, the module further including the local event map indicative of subscriber entities including handlers associated with the mapped event, the module operable to invoke, via the local event map, the identified subscribers including associated handlers.

41. (Original) The method of claim 39 wherein the persistent map of the event is operable to maintain the event independently of individual modules

referencing the event, the independent maintenance operable to avoid copy constructors of the event for enabling successive references to the same event.

42. (Original) The method of claim 34 further comprising a plurality of events, the plurality of events associated with a genericizing reference, the genericizing reference inclusive of the plurality of events and each of the events associated with an event specific class having event data indicative of event specific parameters.

43. (Original) The method of claim 42 wherein the event data includes event variables generated and passed by the publisher of the event and subscriber instantiated variables generated by the state information of the subscriber.

44. (Original) The method of claim 39 wherein traversing further comprises indexing, in the persistent mapping via the event identity, a persistent reference to the modules including the event handlers associated with the event, the persistent reference operable to identify a handler independently of enablement of the module containing the associated event handler.

45. (Original) The method of claim 34 wherein the event service further includes:

- a component event service operable to generate the local mapping entry in the component event map having a reference to the subscriber entity including the corresponding event handler, and

- a persistent event map operable to store a persistent mapping entry corresponding to the module including the corresponding event handler, the persistent mapping entry operable to trigger selective enablement of the handling component by a plurality of subscribing entities, the persistent event map further

operable to identify at least one of the persistent mapping entries corresponding to the published event, each of the mapping entries indicative of a module;

a local event map operable to a plurality of subscribers including the corresponding event handlers in the identified modules associated with the event.

46. (Original) The method of claim 37 further comprising a thread manager, wherein each of the modules is operable to include a plurality of threads, and wherein the thread manager is operable to perform graceful termination each of the threads prior to deactivation, deactivation occurring by informing each of the threads of the termination and computing when each thread has attained a termination point.

47. (Original) The method of claim 34 wherein the association between the event identity and the corresponding event handler further comprises:

a local mapping in a local event map identifying a subscribing entity including an event handler corresponding to the event identity, and

a persistent event mapping in a shared memory portion identifying the module including the event handler corresponding to the event identity.

48. (Original) The method of claim 47 further comprising a strategizing allocator operable to selectively generate the persistent event mapping if the associating of the event identity occurs in a single module.

49. (Currently Amended) A computer program product having a computer readable storage medium operable to store computer program logic embodied in computer program code as a set of computer instructions encoded thereon for processing events in a managed information system comprising:

-17-

computer program code for receiving an event subscription containing an event identity for an event, the event corresponding to ~~significant~~reportable occurrences in the managed information system;

computer program code for associating the event identity with an event handler responsive to the event by creating a mapping of the event identity to the event handler;

computer program code for receiving a publication of the event; and

computer program code for traversing, in response to the publication, the mapping of the event identity to an indication of the corresponding associated handler, the traversing operable to enable the module including the event handler if the module is disabled at the time of publishing the event, enabling modules corresponding to activation of a corresponding component by an activation mechanism, and disabling corresponding to deactivation of the corresponding component by the activation mechanism, the activation and deactivation operations operable to reduce memory consumption by inactive components and provide selective invocation to maintain availability of the component, the enabling and disabling performed at a level of granularity of the modules, each of the modules corresponding to a component and operable be enabled and disabled by activation and deactivation of the corresponding component.

50. (Currently Amended) A computer data signal having program code for processing events in a managed information system comprising:

program code for receiving an event subscription containing an event identity for an event, the event corresponding to ~~significant~~reportable occurrences in the managed information system;

program code for associating the event identity with an event handler responsive to the event by creating a mapping of the event identity to the event handler, the association between the event identity and the corresponding event handler further comprising:

-18-

a local mapping in a local event map identifying a
subscribing entity including an event handler corresponding to the
event identity, and

a persistent event mapping in a shared memory portion
identifying the module including the event handler corresponding to
the event identity;

program code for receiving a publication of the event; and

program code for traversing, in response to the publication, the
mapping of the event identity to an indication of the corresponding associated
handler, the traversing operable to enable the module including the event handler
if the module is disabled at the time of publishing the even, the traversing further
including:

program code for identifying the event in a persistent event
mapping, the persistent event mapping indicative of modules
containing event handlers associated with the event; and

program code for dispatching, in the identified modules, the
associated event handlers, program code for dispatching
comprising:

program code for selectively receiving an enablement
indication in response to traversing in the persistent event
mapping;

program code for identifying, in a local event mapping
for the enabled module, subscriber entities including
handlers associated with the mapped event; and

program code for invoking, in the mapped module, the
identified subscribers including associated handlers.

51. (Currently Amended) An information processing device for
processing events in a managed information system comprising:

-19-

means for receiving an event subscription containing an event identity for an event, the event corresponding to ~~significant~~reportable occurrences in the managed information system;

means for associating the event identity with an event handler responsive to the event by creating a mapping of the event identity to the event handler, the association between the event identity and the corresponding event handler further comprising:

a local mapping in a local event map identifying a subscribing entity including an event handler corresponding to the event identity, and

a persistent event mapping in a shared memory portion identifying the module including the event handler corresponding to the event identity;

means for receiving a publication of the event; and

means for traversing, in response to the publication, the mapping of the event identity to an indication of the corresponding associated handler, the traversing operable to enable the module including the event handler if the module is disabled at the time of publishing the event, the means for traversing further including:

means for identifying the event in a persistent event mapping, the persistent event mapping indicative of modules containing event handlers associated with the event; and

means for dispatching, in the identified modules, the associated event handlers, dispatching comprising:

means for selectively receiving an enablement indication in response to traversing in the persistent event mapping;

means for identifying, in a local event mapping for the enabled module, subscriber entities including handlers associated with the mapped event; and

-20-

means for invoking, in the mapped module, the
identified subscribers including associated handlers.